National SAFE KIDS Campaign®

Report to the Nation: Trends in Unintentional Childhood Injury Mortality, 1987-2000

May 2003

Friends:

For the past 15 years, the National SAFE KIDS Campaign and founding sponsor Johnson & Johnson together have made a deep commitment to preventing unintentional childhood injury — and it's working. **From 1987 to 2000, the unintentional injury death rate among children ages 14 and under has dropped by almost 40 percent — one of the most dramatic declines ever seen in a children's health issue.**

The combined efforts of the Campaign, its 500 coalitions and chapters and many other groups – including corporations, government agencies, public policymakers, medical professionals, and public health and advocacy organizations – have led to remarkable achievements in preventing childhood death and injury.

Despite this tremendous progress, unintentional injury remains the number one killer of children ages 14 and under in the United States, claiming more than 5,600 lives each year — or an average of 15 children each day. And there were more than 11.8 million medical visits for unintentional injury among children ages 14 and under in 2000 — or one injury visit for every five children.

These facts underscore both the value of what we're doing, and the need to continue.

To mark the 15th anniversary of our vital partnership with Johnson & Johnson, we've undertaken this comprehensive study, *Report to the Nation: Trends in Unintentional Childhood Injury Mortality, 1987 – 2000*.

This landmark study measures the state of unintentional childhood injuries by examining some of the key factors of this epidemic. In particular, the research addresses important trends in mortality rates, differing progress made across a variety of risk areas, and which children — by race, gender, ethnicity and geographic location — have shown the greatest and least reductions in the injury death rate.

What should be done?

Plenty. Starting with a renewed commitment by all Americans to place a priority on child injury prevention. **These injuries are not inevitable; they are *preventable*.**

Our long-term partnership with Johnson & Johnson has helped save children's lives through increased awareness, important new legislation, improved habits and behaviors of parents and caregivers, vital research and the recruitment and training of child safety coalitions and chapters across the nation.

This study builds on our joint momentum and provides a roadmap for future advances. I encourage you to read it, spread the news, and do whatever you can to help us create an America where all kids are truly "safe kids."

Sincerely,

Martin R. Eichelberger, M.D.
President and Founder
National SAFE KIDS Campaign

Professor of Surgery and Pediatrics,
George Washington University
Director of Trauma and Burn Services,
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The unintentional injury death rate among children ages 14 and under declined 39 percent from 1987 to 2000.

INTRODUCTION

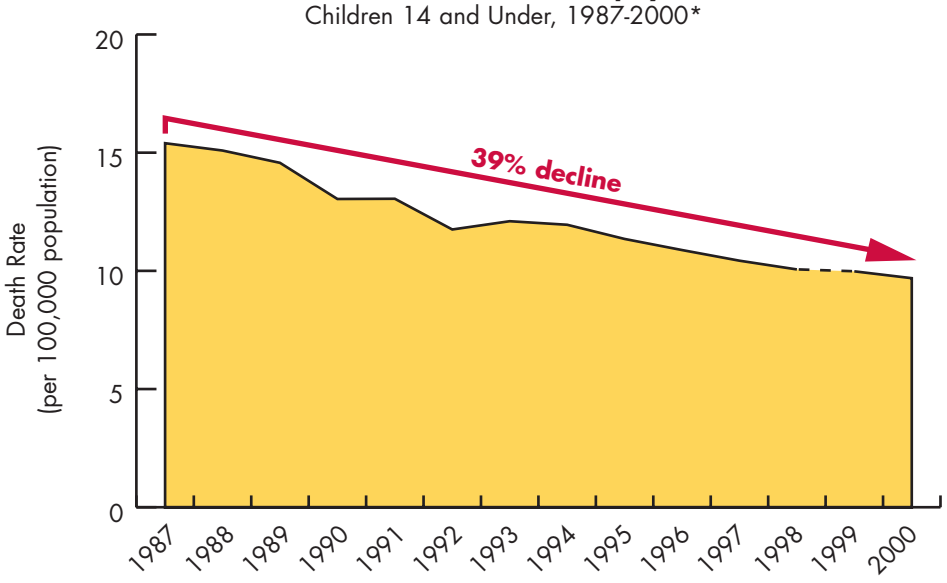
Preventable injuries take an enormous financial, emotional and social toll not just on the injured children and their families, but also on society as a whole. Unintentional injury is the leading cause of death among children ages 14 and under in the United States, claiming more than 5,600 child lives annually, or an average of 15 children each day.[1] In addition, there were nearly 11.8 million medical visits for unintentional injury among U.S. children ages 14 and under in 2000,[2] or one injury visit for every five children. More than 16 percent of all hospitalizations for unintentional injuries among children result in permanent disability.[3]

SAFE KIDS analyzed national injury mortality data with the following questions in mind: What have been the trends in unintentional injury death rates since the inception of the Campaign? How do major injury risk areas differ in the progress made towards prevention? Which children – by race, gender, and ethnicity and in which geographic regions – have shown the greatest reductions in the injury death rate?

KEY FINDINGS

The unintentional injury death rate among children ages 14 and under declined 39 percent from 1987 to 2000. The death rate declined 42 percent for children ages 1 to 14.

Fatal Unintentional Injury
Children 14 and Under, 1987-2000*

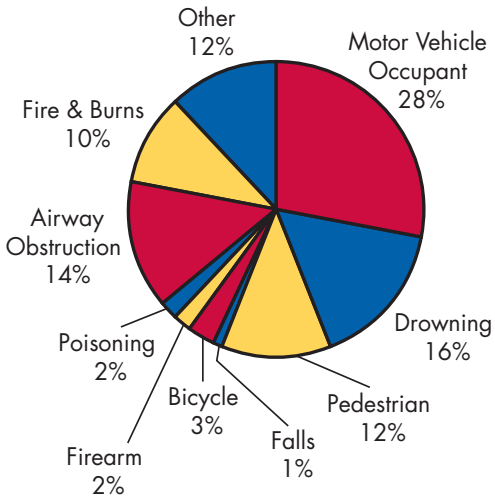


* A dashed line indicates changes in injury coding between years 1998 and 1999.

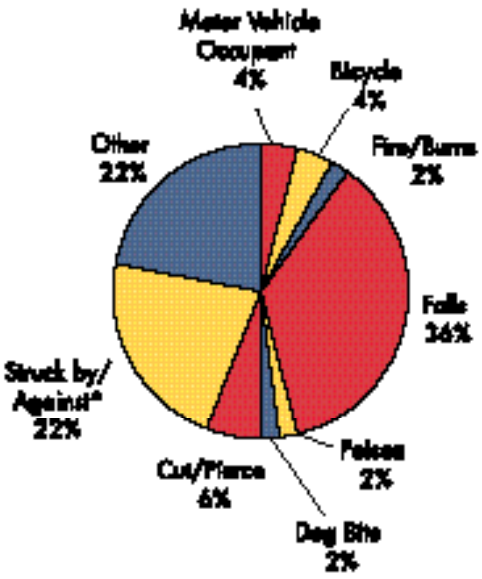
Source: National Center for Health Statistics, Centers for Disease Control and Prevention

Despite this decline, unintentional injury continues to be the leading cause of death among children ages 14 and under in the United States. In 2000, the leading cause of fatal unintentional injury among children was motor vehicle occupant injury (28 percent), followed by drowning (16 percent) and airway obstruction injury (14 percent). Falls (36 percent) were the leading cause of nonfatal, hospital emergency room-treated childhood injury in 2001.

Leading Causes of Fatal Unintentional Injury
Children 14 and under, 2000



Leading Causes of Nonfatal Unintentional Injury
Children 14 and under, 2001



* Struck by an object other than a vehicle or machinery.

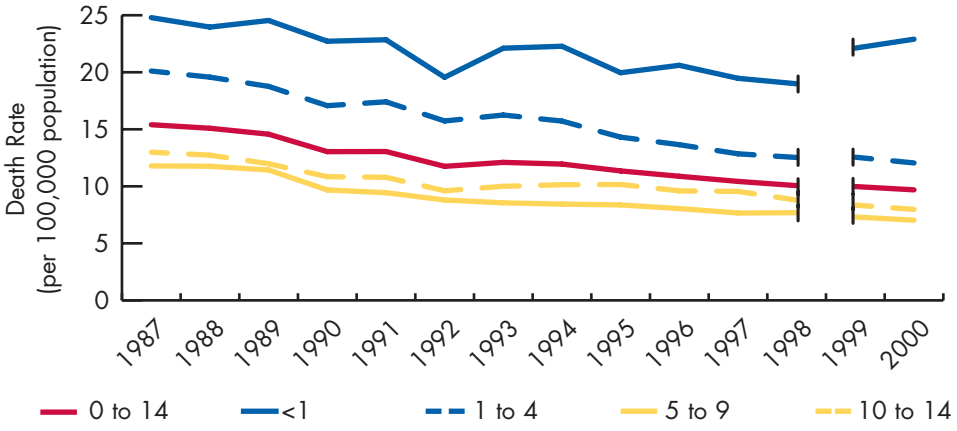
Source: National Center for Health Statistics, Centers for Disease Control and Prevention (fatal); National Electronic Injury Surveillance System – All Injury Program (nonfatal)

Injury rates vary with a child's age, gender, race, geographic region and socio-economic status. Younger children, males, minorities and poor children suffer disproportionately.

AGE

The least progress in the injury death rate decline was among infants under age 1, who had a decline of only 10 percent, compared with children in the age groups 1 to 4 (42 percent), 5 to 9 (42 percent), and 10 to 14 (40 percent).

Fatal Unintentional Injury by Age
Children 14 and under, 1987-2000



Source: National Center for Health Statistics, Centers for Disease Control and Prevention

Leading causes of unintentional injury-related death vary according to a child's age and are dependent upon developmental abilities and exposure to potential hazards, in addition to parental perceptions of a child's abilities and injury risk. Injuries tend to occur when a task's demands exceed the child's ability to safely complete it.

Despite tremendous progress, unintentional injury remains the number one killer of children ages 14 and under.

Children under age 1 have the highest rate of unintentional injury-related death with a rate more than twice that of all children. In addition, they have made the least progress – only a 10 percent reduction in the death rate. Airway obstruction is the leading injury killer in this age group, accounting for nearly 60 percent of unintentional injury deaths.

Children ages 1 to 4, who have the second highest rate of unintentional injury-related death, showed an injury death rate decline of 42 percent. Drowning, accounting for 27 percent of unintentional injury deaths, is the leading injury killer in this age group.

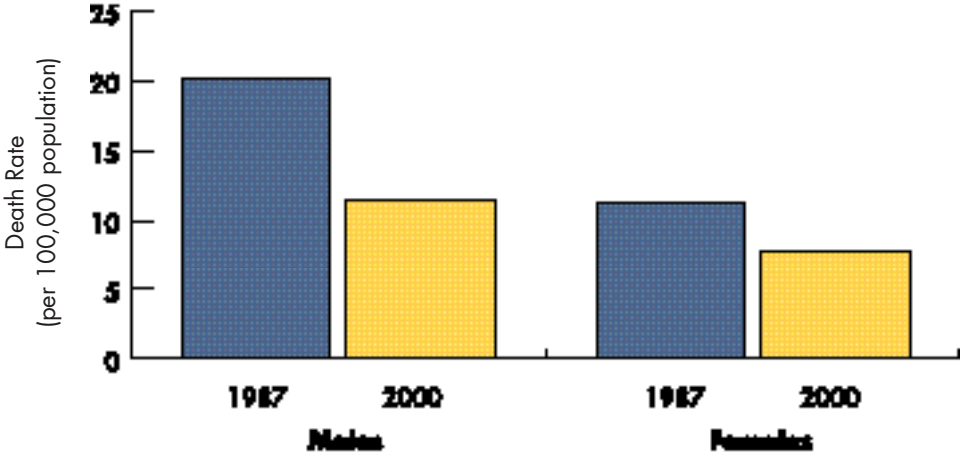
Children ages 5 to 9 have the lowest rate of unintentional injury-related death among children ages 14 and under and had a 42 percent rate reduction. Motor vehicle occupant injury is the leading cause of death in this age group, accounting for 35 percent of unintentional injury deaths.

Children ages 10 to 14, who have the third highest rate of unintentional injury-related death had a death rate decline of 40 percent. Motor vehicle occupant injury is the leading killer in this age group, responsible for 40 percent of unintentional injury deaths.

SEX

- The unintentional injury death rate for boys ages 14 and under declined 43 percent between 1987 and 2000, compared with a decline of only 31 percent for girls of the same age.
- However, the unintentional injury death rate for boys remains nearly 1.5 times higher than that for girls.

Fatal Unintentional Injury by Sex
Children 14 and under, 1987* vs. 2000



* 1987 data adjusted using the all injury comparability ratio.

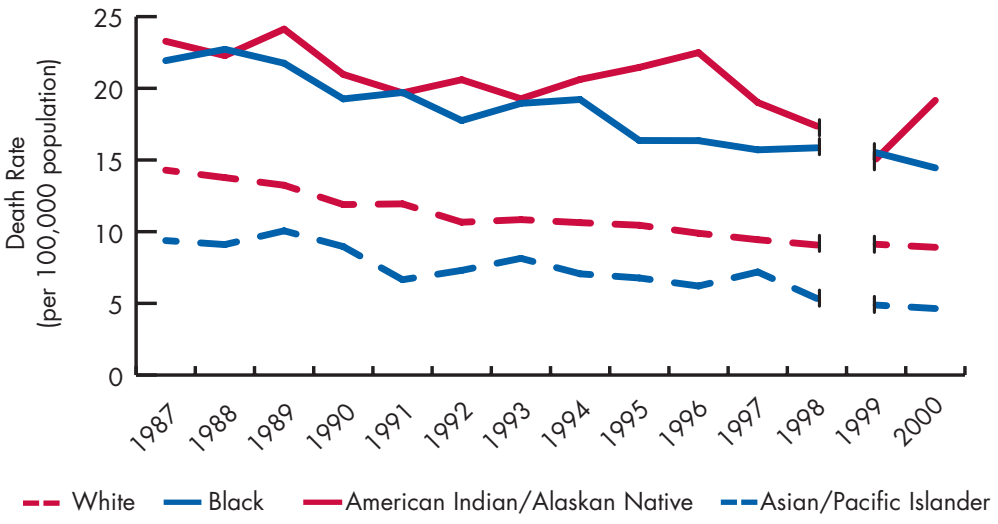
Source: National Center for Health Statistics, Centers for Disease Control and Prevention

Through virtually all ages, for all causes of injury, males are at greater risk of unintentional death and injury than females. This is primarily due to greater exposure among males to activities that result in injury and patterns of risk taking and rough play.[7] [8] In addition, parental standards for child supervision may differ by sex.[9]

RACE & ETHNICITY

- The smallest reductions in unintentional injury death rates are among American Indian/Alaskan Natives and black children, with declines of 20 percent and 36 percent, respectively.
- Asian/Pacific Islander children showed an unintentional injury death rate reduction of 52 percent, and white children, 39 percent.
- The child injury death rate dropped 6 percent for Hispanics from 1997 to 2000, compared with 10 percent for Non-Hispanics.

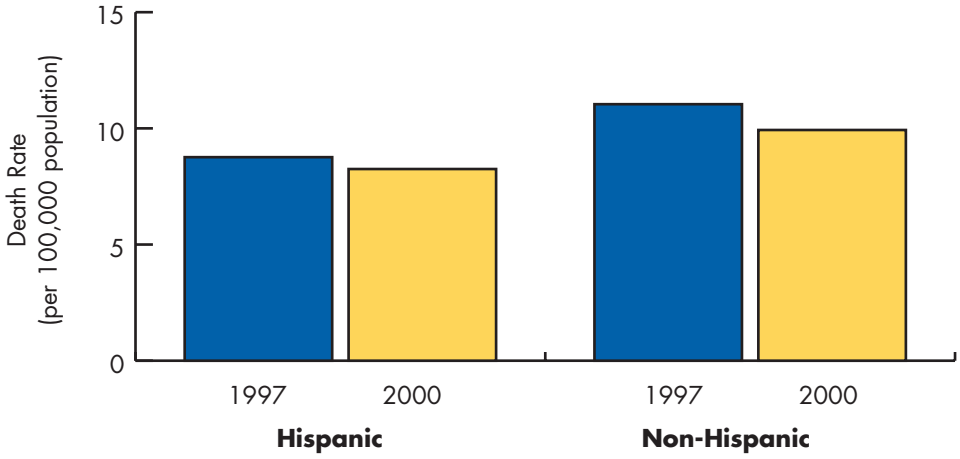
Fatal Unintentional Injury by Race
Children 14 and under, 1987-2000



Source: National Center for Health Statistics, Centers for Disease Control and Prevention

Racial and ethnic disparities in unintentional injury rates have more to do with living in impoverished communities, a primary predictor of injury, than with biological differences.[10] [11] [12] [13] American Indian/Alaskan Native children have the highest unintentional injury death rate,[14] and black children the second highest, with death rates nearly twice that of white children. Non-Hispanic children have a death rate 20 percent higher than that for Hispanic children.

Fatal Unintentional Injury by Ethnicity
Children 14 and under, 1997* vs. 2000



* 1997 data adjusted using all-injury comparability ratio.

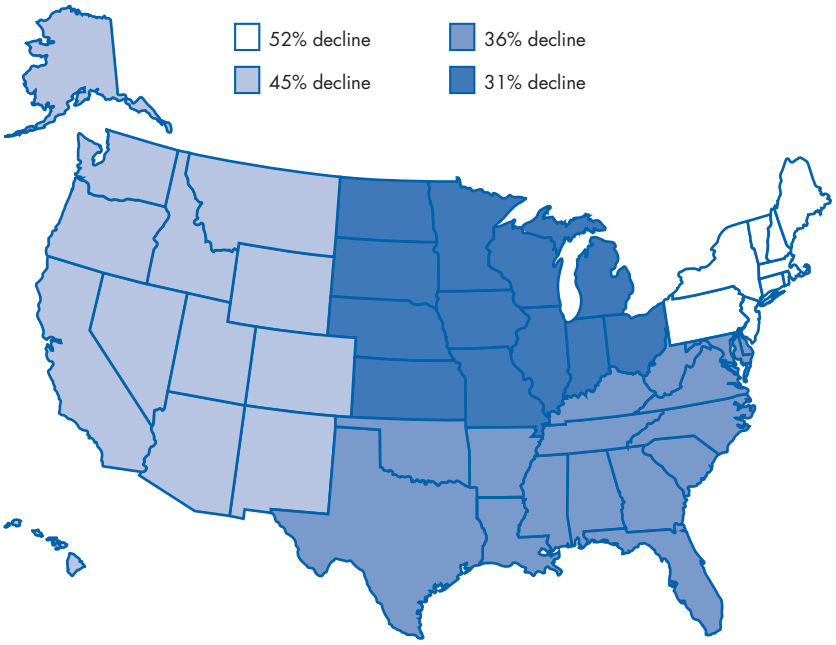
Source: National Center for Health Statistics, Centers for Disease Control and Prevention

American Indian/ Alaskan Native children have the highest unintentional injury death rate, and black children the second highest, with death rates nearly twice that of white children.

GEOGRAPHY

- The Northeast showed the greatest decline in the death rate for children ages 14 and under – 52 percent – compared with the West (45 percent), South (36 percent), and Midwest (31 percent).
- Particularly impressive is the 59 percent reduction in the death rate among Northeastern children ages 10 to 14.

Decline in Unintentional Death Rate by Region



Geographic differences in injury death rates reflect diversity among the states in both demographics and differential exposure to specific injury hazards. Rates of unintentional injury tend to be highest in the West and South.[15] This disparity is most likely related to the large number of people in southern and mountain regions living in rural communities, which are known to have reduced access to trauma care, lower levels of restraint use and a disproportionate share of people in poverty.[16] [17] [18] [19] Additionally, the temperate climates in these regions enable children to spend more time playing outdoors, a risk factor for unintentional childhood injury.[20]

RISK AREA ANALYSIS

Each mechanism of injury presents its own challenges for prevention. Here we present an overview of each risk area and trends in the childhood death rate from 1987 to 2000. Although we have attempted to present a summary of risk-specific prevention strategies that may have contributed to the trends, we must note that it is difficult to speculate about what causes changes in injury death rate patterns because so few interventions are rigorously evaluated and because so many separate influences – associated with both prevention and treatment of injury – are operating simultaneously. Finally, we present action steps the National SAFE KIDS Campaign believes are imperative for future generations to be protected from unintentional injury.

MOTOR VEHICLE OCCUPANT INJURY

The motor vehicle occupant death rate among children ages 14 and under declined 16 percent from 1987 to 2000. Motor vehicle occupant injury remains, however, the leading cause of injury-related death among children. In 2000, 1,654 child occupants ages 14 and under died in motor vehicle crashes.[21] In addition, an estimated 228,000 child occupants in this age group were injured in motor vehicle crashes in 2001.[22]

The greatest motor vehicle occupant injury death rate decline (24 percent) occurred among children ages 1 to 4, a drop comparable to that of children under age 1 (21 percent). Children under 1 continue to be at high risk for motor vehicle occupant injury, with a death rate nearly 1.5 times that of all children. Children ages 10 to 14 showed a death rate reduction of only 11 percent. Unfortunately, the death rate for children ages 5 to 9 remained almost the same, dropping only 1 percent. Adult safety belts do not adequately protect children under age 8 from crash injury.[23] Although belt-positioning booster seats are the best way to protect them, only 19 percent of children who should be restrained in booster seats use them.[24]

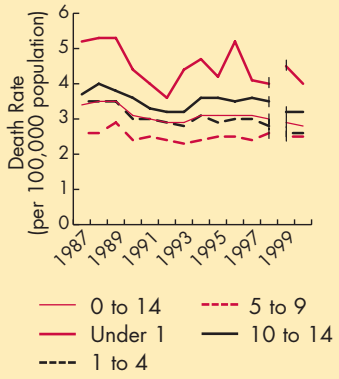
Of the U.S. geographic regions, the South exhibited the least decline (29 percent) in the motor vehicle occupant death rate for children ages 14 and under, compared with 73 percent for the Northeast, 37 percent for the Midwest and 46 percent for the West. Children in the South and West continue to be at increased risk for motor vehicle occupant death, with rates nearly four times higher than that of the Northeast. This disparity in risk most likely reflects the large number of people in southern and mountain regions living in rural and impoverished communities. Restraint use is lower in rural and low-income communities,[25] [26] [27] [28] and rural highways are more dangerous due to high vehicle speeds, poor road conditions and insufficient access to emergency medical services.[29] Additionally, geographic regions likely differ in exposure to this injury risk (i.e., number of miles traveled by motor vehicle).

FACTORS CONTRIBUTING TO THE TREND

Because riding unrestrained is a significant risk factor for death and injury among child occupants of motor vehicles, heightened public awareness of the importance of appropriate selection and proper installation of child safety seats, coupled with increases in the use of child restraint, have contributed to this injury death rate reduction. Additionally, the nationwide proliferation of child safety seat education and distribution programs – and in particular, increased availability of child restraint inspection opportunities utilizing trained checkers – has increased the prevalence and proper usage of these vital safety devices. Improvements to the design of roadways and motor vehicles, child restraint devices and child restraint laws – present in all 50 states, the District of Columbia and all U.S. territories – have also enhanced occupant safety.

However, much more work needs to be done. An estimated 14 percent of children ages 14 and under ride unrestrained, and 55 percent of those children killed as motor vehicle occupants in 2001 were unrestrained.[30] [31] In addition, nearly one-third of children ride in the wrong restraint for their age and size,[32] and an estimated 82 percent of child safety seats are installed or used incorrectly.[33]

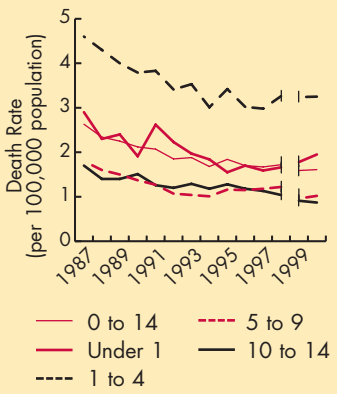
Fatal Motor Vehicle Occupant Injury
Children 14 and under, 1987-2000



RECOMMENDATIONS FOR THE FUTURE

- Increase funding for child passenger safety training inspection opportunities, as well as for safety seat distribution to families in need, and include booster seats in child restraint education and distribution programs
- Close all gaps in and improve enforcement of child occupant protection laws and strengthen safety belt laws in every state from secondary to primary enforcement
- Establish federal regulation for currently unregulated occupant protection devices (e.g., shoulder belt positioners, safety belt tighteners, add-on products) and expand the applicability of federal standards to devices for larger, heavier children
- Educate the public on the new universal child restraint attachment system (LATCH) and on the correct selection, installation and use of child safety seats

Drowning
Children 14 and under,
1987-2000



RECOMMENDATIONS FOR THE FUTURE

- Create and fund a multi-faceted, nationwide drowning awareness campaign
- Increase public education efforts that address the dangers to young children from drowning in swimming pools, spas, bathtubs, five-gallon buckets, toilets and open bodies of water
- Advocate for increased funding at public beaches to establish or retain lifeguarding services
- Enact and enforce mandatory four-sided pool isolation fencing laws in all 50 states, the District of Columbia and all U.S. territories
- Enforce current mandatory child PFD use laws in applicable states and the new U.S. Coast Guard interim rule requiring all children under 13 years old to wear an approved life jacket when underway on a recreational vessel

DROWNING

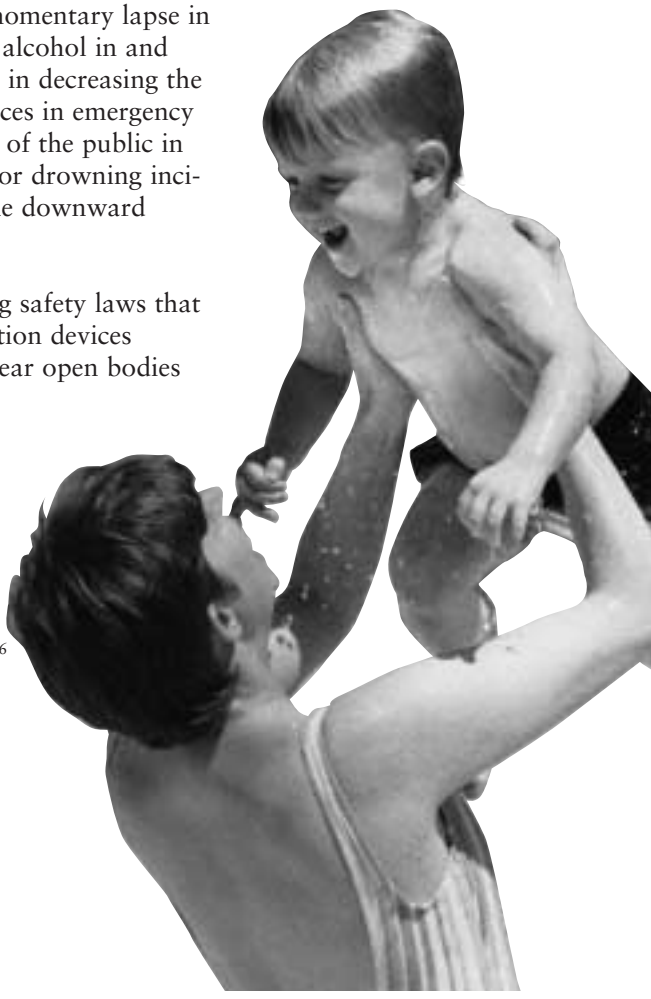
The childhood drowning death rate declined 32 percent from 1987 to 2000. Despite this decline, drowning remains the second leading cause of unintentional injury-related death among children ages 14 and under, claiming 943 children in this age group in 2000.[34] In addition, an estimated 4,700 children ages 14 and under required hospital emergency room treatment for unintentional drowning-related incidents in 2001.[35] As many as 20 percent of near-drowning survivors suffer severe, permanent neurological disability.[36]

Children ages 1 to 4 are at greatest risk of drowning, with a death rate twice as high as that for all children. This age group also demonstrated the least decline in the death rate (22 percent). Children 10 to 14 had the largest reduction in the drowning death rate (43 percent).

Of the U.S. geographic regions, the West showed the greatest improvement, with a drop of 46 percent. Comparatively, the South – which continues to have the highest child drowning death rate – experienced a 28 percent death rate reduction. Variations in climate, water temperature and patterns of water exposure help to explain higher drowning fatality rates in southern and western states.[37]

FACTORS CONTRIBUTING TO THE TREND

Water safety public education efforts – emphasizing that drowning is a silent event[38] [39] [40] that typically occurs when a child is left unattended or during a momentary lapse in supervision[41] [42] – and decreased use of alcohol in and around water[43] have been instrumental in decreasing the childhood drowning death rate. Advances in emergency medical services and increased training of the public in cardiopulmonary resuscitation (CPR) for drowning incidents have also likely contributed to the downward trend.



Thirty-eight states have enacted boating safety laws that require children to wear personal flotation devices (PFDs) at all times when on boats or near open bodies of water, the most common site of childhood drownings.[44] Additionally, a reduction in child drownings may be attributable, at least in part, to reduced exposure to hazardous open bodies of water, perhaps due to increased sedentary behavior.[45] As swimming pools are the second most common site of childhood drownings,[46] the installation of isolation (i.e., four-sided) fencing, self-closing and self-latching gates, pool alarms and pool covers in some homes may have also contributed in small part to declines in the drowning death rate. However, much more work is needed to increase the use of these barriers and safety devices.

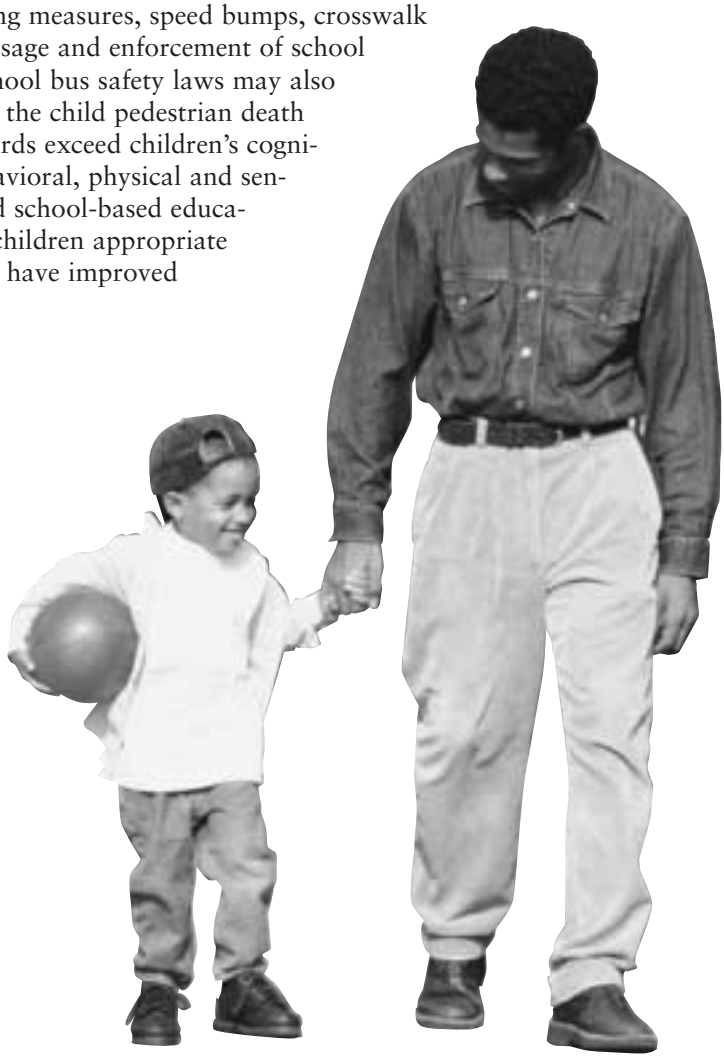
PEDESTRIAN INJURY

The pedestrian injury death rate among children ages 14 and under dropped 51 percent from 1987 to 2000. Pedestrian injury remains, however, the second leading cause of unintentional injury-related death for children ages 5 to 14. In 2000, 706 child pedestrians ages 14 and under died, and 534 of these deaths occurred in motor vehicle-related traffic crashes.[47] Additionally, an estimated 47,300 children in this age group were treated in hospital emergency rooms for pedestrian-related injuries in 2001.[48]

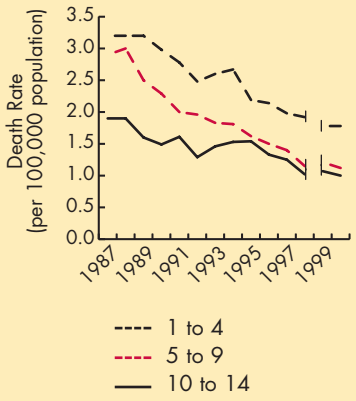
The greatest reduction occurred among children ages 5 to 9 (61 percent), primarily due to a large drop in traffic-related incidents. Among children ages 14 and under, those ages 1 to 4 are at greatest risk of pedestrian death, particularly from nontraffic-related pedestrian injuries. This age group demonstrated the smallest pedestrian death rate reduction (44 percent).

FACTORS CONTRIBUTING TO THE TREND

Decreased walking among children – attributed to many causes including large traffic volume, long distances between home, school and recreation, increased crime rates, and other unsafe walking conditions[49] – has contributed to this downward trend by reducing children's exposure to risk. Improvements in pedestrian environments (e.g., traffic-calming measures, speed bumps, crosswalk installations) and the passage and enforcement of school zone speed limits and school bus safety laws may also have assisted in reducing the child pedestrian death rate. Because traffic hazards exceed children's cognitive, developmental, behavioral, physical and sensory abilities,[50] integrated school-based educational efforts that teach children appropriate street-crossing skills may have improved pedestrian safety.



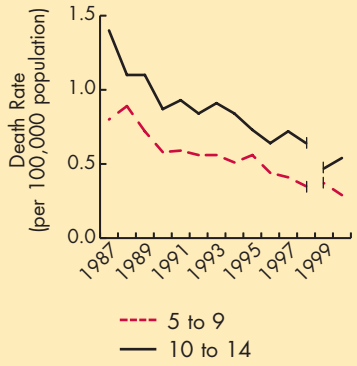
Fatal Pedestrian Injury
Children 1 to 14, 1987-2000



RECOMMENDATIONS FOR THE FUTURE

- Advocate for environmental modifications (e.g., more signage, lights and crosswalks), traffic-calming devices and enforcement measures to slow vehicle speeds and enable safe walking
- Continue to support the goals and objectives in the National Strategies for Advancing Child Pedestrian Safety, and advocate for funding for programs such as Safe Routes to School
- Tailor public education campaigns to drivers, stressing the rights of pedestrians, particularly in school zones and residential areas, and to parents, encouraging supervision of children under the age of 10 when they cross the street
- Encourage parents to walk with their children to school and recreation areas to decrease traffic congestion and increase safety
- Educate parents about the importance of children wearing retroreflective materials and carrying flashlights at dawn, dusk and other low-light situations while walking

Fatal Bicycle-Related Injury
Children 5 to 14, 1987-2000



RECOMMENDATIONS FOR THE FUTURE

- Present more targeted messages to parents and children about the consequences of not wearing a helmet, and encourage all caregivers to be role models by wearing helmets
- Advocate for bike-friendly communities that include multi-use paths, bike lanes and adequate lighting and traffic-calming measures to slow down cars
- Pass helmet laws for bicycles and other wheeled sports in all 50 states and U.S. territories
- Continue to support the goals and objectives in the National Strategies for Advancing Bicycle Safety and advocate for funding to establish programs like Safe Routes to School
- Provide more education to young riders to build traffic skills and bicycle maneuverability, as well as targeted messages to drivers about sharing the road

BICYCLE INJURY

The bicycle injury death rate among children ages 14 and under declined 60 percent from 1987 to 2000, yet bicycle injury remains an important cause of child mortality and morbidity. In 2000, 168 children ages 14 and under died in bicycle-related crashes.[51] Nearly 315,000 children ages 14 and under were treated in hospital emergency rooms for bicycle-related injuries in 2001.[52]

The greatest death rate reduction (63 percent) was among children ages 5 to 9, primarily due to a 68 percent decline in the traffic-related death rate. Children ages 10 to 14 showed a 61 percent decline and have the highest bicycle-related death rate of all child age groups.

FACTORS CONTRIBUTING TO THE TREND

Scientific evidence has shown that the single most effective safety device available to reduce head injury and death from bicycle crashes is a helmet, which reduces the risk of bicycle-related death and injury, as well as the severity of head injury when a crash occurs.[53] [54] [55] [56] [57] [58] [59] The nationwide proliferation of bicycle helmet education campaigns and activities (such as rodeos and safety fairs), and improvements in helmet design have likely made a difference. The enactment and enforcement of mandatory bicycle helmet legislation (in 19 states, the District of Columbia and numerous localities across the U.S.) also likely contributed to the decline by increasing the use of this important safety device. However, more must be done to encourage children to wear bicycle helmets, as current national estimates of bicycle helmet use among child bicyclists continue to range from only 15 to 25 percent.[60] [61] While a reduction in bicycle riding may have played a role in the decline, data on this is limited.[62]

AIRWAY OBSTRUCTION INJURY

Among children ages 14 and under, the airway obstruction injury (AOI) death rate decreased 24 percent between 1987 and 2000, primarily due to a decline of 42 percent among children ages 1 to 4. However, as demonstrated by a 6 percent increase (not determined to be statistically significant) in the death rate among infants under age 1, AOI persists as one of the most challenging child injury risk areas. Airway obstruction injury, a category that includes suffocation, choking and strangulation, is the leading cause of unintentional injury-related death among infants under age 1. In 2000, 794 children ages 14 and under died from unintentional airway obstruction injuries, including 160 choking deaths.[63] [64] More than 16,000 children in this age group needed hospital emergency room treatment for airway obstruction injuries in 2001 alone.[65]

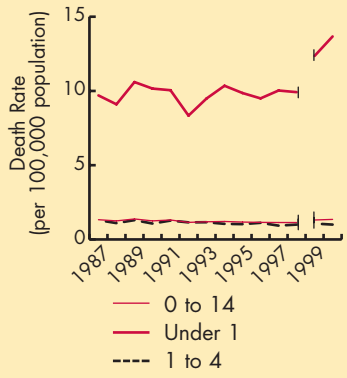
Children, especially those under age 3, are particularly vulnerable to airway obstruction injury due to their small upper airways, their relative inexperience with chewing and their natural tendency to put objects in their mouths.[66] On average, infants account for approximately 64 percent of unintentional AOI deaths among children ages 14 and under, and have a death rate 10 times that of all children.

FACTORS CONTRIBUTING TO THE TREND

Major causes of AOI death include suffocation by materials such as pillows, choking on food or small objects, and strangulation from window blinds and clothing strings. Improvements in the design of infant furniture, cribs, playpens and other juvenile products, and the removal of drawstrings from children's clothing have contributed to the overall downward trend by combating these principal causes. Additionally, a relatively inexpensive safety device, the "small parts tester," has been made available to the general public. The Child Safety Protection Act, which passed in 1994 and is enforced by the U.S. Consumer Product Safety Commission (CPSC), bans any toy intended for use by children under age 3 that poses a choking, aspiration or ingestion hazard and requires choking hazard warning labels on packaging for these items when intended for use by children ages 3 to 6. More widespread education of parents and caregivers in first aid and CPR and about AOI hazards may also have helped reduce this injury death rate among children.

The reasons for AOI trend differences by age group are unknown.[67] It is possible, however, that the recent increase in AOI deaths among infants reflects more accurate suffocation coding of child deaths that in the past may have been attributed to sudden infant death syndrome, or SIDS.

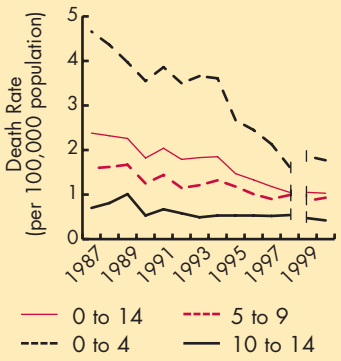
Fatal Airway Obstruction Injury
Children 14 and under, 1987-2000



RECOMMENDATIONS FOR THE FUTURE

- Strengthen efforts to educate parents about food and non-food choking hazards to children
- Educate parents, grandparents, babysitters, child care center personnel and other caregivers about correct sleeping positions and environments for infants
- Maintain industry and government regulation of products that present choking, entrapment or suffocation hazards and encourage parents to check regularly for recalls
- Include standardized CPR and Heimlich maneuver training in prenatal birth classes and comprehensive health education courses
- Encourage parents to buy age-appropriate toys and to be aware of common strangulation hazards, including window blind cords and drawstrings on clothing

Fatal Fire and Burn Injury
Children 14 and under, 1987-2000



ECOMMENDATIONS OR THE FUTURE

- Pass, strengthen and enforce smoke alarm and automatic home fire sprinkler systems in all 50 states, the District of Columbia and all U.S. territories throughout the year
- Target messages about fire and burn prevention to families at greatest risk
- Support and evaluate local and national efforts to decrease the incidence of juvenile fire-setting
- Encourage federal agencies to continue to monitor consumer products that present fire risks
- Distribute and install smoke alarms to increase the availability of working smoke alarms (including those designed for visually and hearing-impaired children) in the home, and emphasize to families the importance of testing smoke alarm batteries each month
- Design or modify hot water heaters to prevent water temperatures above 120 degrees Fahrenheit
- Encourage families to plan two escape routes out of each room of the house and practice drills throughout the year

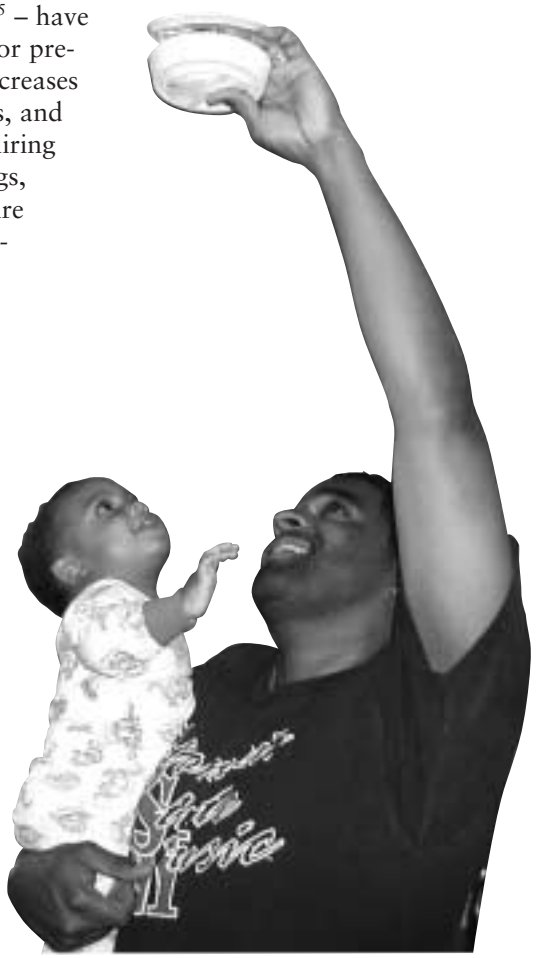
FIRE AND BURN INJURY

The death rate from fire and burn injury declined 56 percent among children ages 14 and under from 1987 to 2000, yet fire and burn injury remains the fifth leading cause of child unintentional injury-related death. In 2000, 603 children ages 14 and under died from unintentional fire and burn injury. Fire and flames accounted for 593, or 98 percent, of these deaths.[68] Additionally, in 2001 an estimated 99,400 children ages 14 and under were treated in hospital emergency rooms for burn-related injuries - including scald, thermal, chemical and electrical burns.[69]

Children ages 4 and under are at the greatest risk, with a fire- and burn-related death nearly twice that of all children. This age group demonstrated the greatest reduction in death rate (61 percent), compared with 40 percent for children 5 to 9 and 39 percent for children 10 to 14. Young children have a less acute perception of danger, limited ability to quickly and properly respond to a life-threatening fire or burn situation,[70] and faster metabolic rates. They are also less able to physically tolerate toxic combustion products, rendering them more susceptible to fire-related asphyxiation.[71] [72] [73] Additionally, because younger children have thinner skin than adults, their skin burns at lower temperatures and more deeply.[74]

FACTORS CONTRIBUTING TO THE TREND

Smoke alarms – the presence of which cuts the chances of dying in a residential fire nearly in half [75] – have been duly promoted as an invaluable tool for preventing fire and burn injury. Nationwide increases in the prevalence of smoke alarms in homes, and the passage of smoke alarm legislation requiring smoke alarms for new and existing dwellings, partly explain the downward trend in the fire and burn death rate. Intensive public education campaigns by federal agencies such as the CPSC and U.S. Fire Administration, national organizations and fire departments that promote residential fire safety and burn prevention have played a role. These efforts to educate parents about the importance of planning fire escape routes, checking smoke alarm batteries monthly, and lowering water heater temperatures to 120 degrees Fahrenheit (49 degrees Celsius) to prevent scald burns – as well as active grassroots involvement in distributing and checking smoke alarms, have likely made a difference. The regulation of child-resistant cigarette lighters, fireworks and other burn-related products by the CPSC, and the enforcement of the CPSC Flammable Fabrics Act that set flammability standards for apparel, children's sleepwear, rugs and mattresses, have also been important.



UNINTENTIONAL FIREARM INJURY

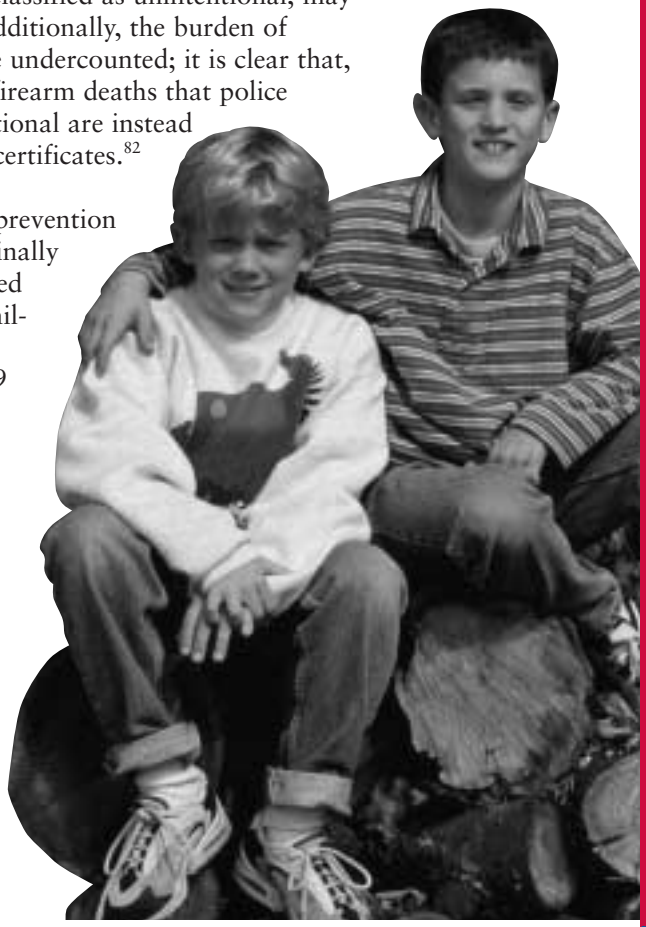
The decline in the unintentional firearm injury death rate among children ages 14 and under from 1987 to 2000 was 72 percent, one of the most remarkable of the injury risk areas reviewed for this analysis. However, 86 children ages 14 and under died from unintentional firearm-related injuries in 2000.[76] For every child who dies from an unintentional firearm-related injury, there are 16 children who require treatment in hospital emergency rooms for these injuries – an estimated 1,400 children ages 14 and under in 2001. Approximately 21 percent of these injuries are severe enough to require hospitalization.[77]

Children ages 10 to 14 have the highest rate of unintentional firearm-related death, a rate 1.5 times higher than that of all children. This age group declined 75 percent, compared with nearly 80 percent for the age group 5 to 9.

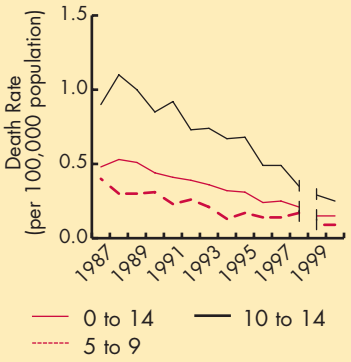
FACTORS CONTRIBUTING TO THE TREND

Much more research is needed to elucidate the factors that have contributed to the downward trend in unintentional childhood firearm-related mortality. Because exposure to guns and access to a loaded firearm increase the risk of firearm-related death and injury to children,[78] [79] [80] a decrease in gun ownership in homes with children is likely to have been instrumental in decreasing the death rate by reducing children's exposure to firearms. The specific reasons for the decline in gun ownership, however, remain unclear and should be investigated. Increasing urbanization may also have played a role; there exists a very high rural to urban ratio of firearm-related death rates. Improved identification and classification of firearm suicides, which would have previously been classified as unintentional, may have contributed to the decline.[81] Additionally, the burden of unintentional firearm deaths may be undercounted; it is clear that, at least in recent years, many child firearm deaths that police investigators consider to be unintentional are instead being coded as homicides on death certificates.[82]

Intended as deterrents, child access prevention (CAP) laws, which hold adults criminally liable for failure either to store loaded firearms in a place inaccessible to children or to use safety devices to lock guns, have been passed in at least 19 states and shown effective in those states that allow for felony prosecution of violators.[83] [84] These laws may have helped change social norms about gun storage in homes with children. More must be done, however, to promote safe storage of firearms, including the use of quality gun locks and other safe storage devices, in the home. An estimated 3.3 million children in the United States live in households with firearms that are always or sometimes kept loaded and unlocked.[85] [86]



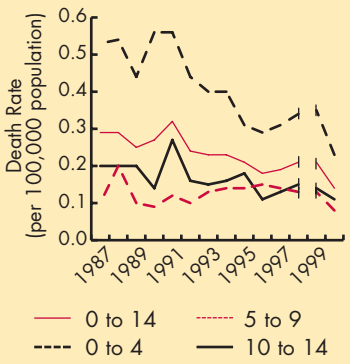
Fatal Unintentional Firearm Injury
Children 14 and under, 1987-2000



RECOMMENDATIONS FOR THE FUTURE

- In homes with firearms, increase the percentage of guns stored safely
- Improve the design and affordability of safe gun technology – e.g., smart guns, load indicators, trigger strength
- Distribute safe storage devices to families in need
- Support the establishment of a performance standard for gun locks

Fatal Fall Injury
Children 14 and under, 1987-2000



RECOMMENDATIONS FOR THE FUTURE

- Improve data collection and surveillance of risk of falls at child care centers, schools and playgrounds
- Actively promote the use of stair gates, product safety straps and American Society of Testing Materials-approved window guards to prevent children from falling
- Heighten awareness among parents and caregivers that infants and other children must be supervised at play, both in and outside of the home
- Increase the number of trained and certified playground inspectors, and educate adults about the need for safe surfacing, age-appropriate equipment and continuous playground maintenance

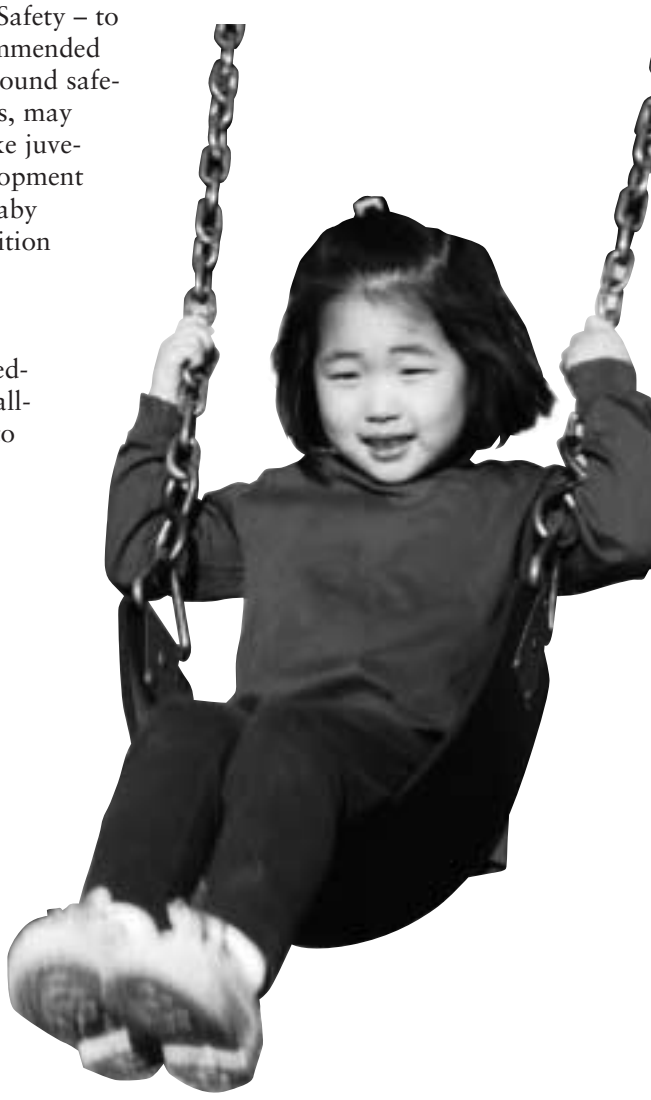
FALLS

The death rate from falls among children ages 14 and under declined 51 percent from 1987 to 2000. Falls, however, continue to be the leading cause of nonfatal unintentional injury among children. In 2000, 81 children ages 14 and under died as a result of unintentional falls.[87] In 2001, more than 2.5 million children in this age group required hospital emergency room treatment for fall-related injuries.[88] More than half of all nonfatal injuries to children are related to falls,[89] [90] and falls are the leading cause of injuries associated with nursery products.[91]

Children ages 4 and under are at greatest risk of fall-related death and are twice as likely as children of other ages to die from falls. Still, this age group has demonstrated the greatest reduction in death rate – 56 percent, compared with 44 percent for children ages 10 to 14 and only 18 percent for children ages 5 to 9.

FACTORS CONTRIBUTING TO THE TREND

By alerting parents to fall hazards to children such as baby walkers, stairs, unsafe playgrounds and windows not equipped with window guards, education campaigns have helped lead to the decline in the fall-related injury death rate. Community efforts – including those led by trained playground inspectors from the National Program for Playground Safety – to renovate playgrounds and install recommended surfacing, as well as mandatory playground safety guidelines enacted in at least 7 states, may also have played a part. Efforts to make juvenile products safer, including the development of stationary alternatives to wheeled baby walkers by manufacturers and the addition of safety straps to child products (e.g., changing tables, high chairs, shopping carts) have helped prevent falls from occurring. Finally, improvements in medical care for complications related to fall-related injuries may have contributed to this downward trend.[92]



POISONING

The childhood unintentional poisoning death rate declined 5 percent from 1987 to 2000. Children are at risk of poisoning from household and personal care products, medicines, vitamins, indoor plants, lead and carbon monoxide (CO).[93] In 2000, 91 children ages 14 and under died as a result of unintentional poisoning.[94] An estimated 114,110 children in this age group were treated in hospital emergency rooms for unintentional poisoning in 2001.

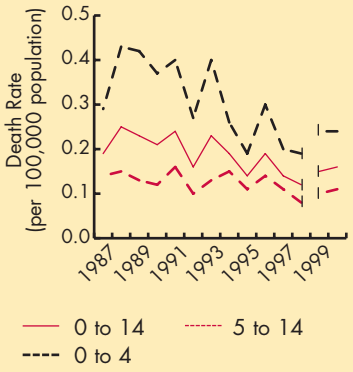
Children ages 4 and under are at greatest risk of unintentional poisoning, with a death rate 1.5 times higher than that of all children. Each year, more than 1.1 million unintentional poisonings among children ages 5 and under are reported to U.S. poison control centers.[95] The poisoning death rate declined 7 percent for children ages 4 and under, compared with 11 percent for children ages 5 to 14.

FACTORS CONTRIBUTING TO THE TREND

This risk area demonstrated the least progress in reducing the child injury death rate during the study period. However, many important advances in poisoning prevention took place before 1987, the first year of data included in this analysis; it is important to note that the childhood poisoning death rate declined 42 percent from 1981 to 1987. Continued efforts to prevent and manage unintentional poisonings have contributed to the additional 5 percent decline since 1987.

Childhood poisoning deaths have declined due to a myriad of factors including the decreased use of aspirin for treatment of child fever, increased use of Ipecac syrup, reduction of the amount and dosage of child analgesics in bottles, and improved medical care for ingestion treatment.[96] The implementation of child-resistant packaging for certain household substances and medications, mandated by the Poison Prevention Packaging Act of 1970, has been instrumental in the death rate reduction.[97] [98] In particular, child-resistant packaging has been associated with a 34 percent reduction in the aspirin-related child death rate.[99] Increased access to certified poison control centers that meet national quality standards, including availability of the nationwide, toll-free poison control center number (1-800-222-1222), and increased poison prevention education have likely contributed to a decline in the child poisoning death rate. Also important has been the issuance of U.S. Food and Drug Administration regulations requiring iron-containing products to carry a warning about acute poisoning risk to children. Finally, intensive efforts to reduce lead in consumer products such as gasoline and paint have contributed to the decline.

Fatal Unintentional Poisoning Injury
Children 14 and under, 1987-2000



RECOMMENDATIONS FOR THE FUTURE

- Increase public education campaigns to improve detection of potential poisoning from carbon monoxide, lead and household products
- Encourage industry to make more affordable carbon monoxide alarms and distribute them to families in need
- Advocate for mandatory child-resistant packaging on all hazardous drugs and household products
- Pass carbon monoxide (CO) detector use laws in all 50 states, the District of Columbia and all U.S. territories

Though the National SAFE KIDS Campaign does not claim sole credit for these declines, we believe our nationwide network of SAFE KIDS coalitions and our multifaceted strategy – incorporating primary research, public awareness, safety device distribution, enactment and enforcement of laws and grassroots partnerships – have played a role in these accomplishments.

CONCLUSION

Since the inception of the National SAFE KIDS Campaign in 1987, the unintentional childhood injury death rate has declined nearly 40 percent. Among the most notable advances in childhood injury prevention are the declines in death rates for unintentional firearm (72 percent) and bicycle-related injury (60 percent). Additionally, the death rate from fire and burn injury declined 56 percent, while that of pedestrian injury dropped 51 percent. Unfortunately, the motor vehicle occupant death rate, particularly among children ages 5 to 9, has been slow to decline. And, no progress was seen for the death rate from airway obstruction injury among infants under age 1.

Many factors have contributed to this dramatic decline in the unintentional childhood injury death rate. These include:

- Research into the epidemiology of unintentional childhood injury-related mortality and the effectiveness of intervention strategies
- Recognition of child injury as a public health issue, amenable to prevention, rather than the result of unforeseen, uncontrollable "accidents"
- Nationwide, targeted public education campaigns by national and community-based organizations and federal agencies
- Continuous development and improvement of safety devices and increases in their use
- Enactment and enforcement of laws promoting child safety

CALL TO ACTION

The National SAFE KIDS Campaign calls upon this nation to place the highest priority on injury prevention. Particular emphasis should be placed on minimizing injury risk to minorities, younger children and motor vehicle occupants. The solutions are clear:

- Conduct research to elucidate the underlying causes of racial-, ethnic- and age-related disparities in injury risk, and strengthen nationwide surveillance of non-fatal injuries by mandating external cause of injury coding for hospital admission and emergency room records in all 50 states
- Evaluate the effectiveness of injury prevention programs and safety devices to ensure that scarce resources are dedicated to those interventions with proven ability to elicit behavioral change and to reduce injury mortality and morbidity among children
- Create and disseminate culturally sensitive prevention messages and materials targeted toward families at greatest injury risk based on income, education, race, ethnicity, and geographic location
- Work with industry to improve the effectiveness of safety products and to make safety devices more affordable and available to all families
- Design and engineer accessible walking, bicycling and play environments (e.g., street lights, traffic calming measures, playgrounds, sidewalks, paths and trails)
- Enact stronger and more rigorously enforced child safety laws to protect children of all ages (e.g., smoke alarm laws, child occupant protection laws, effective swimming pool barrier laws and bicycle helmet laws)

STUDY METHODOLOGY

NATIONAL CHILD INJURY MORTALITY DATA

Data for this analysis were obtained from the National Vital Statistics System (NVSS) of the National Center for Health Statistics (NCHS), Centers for Disease Control and Prevention, for the 14-year period 1987 through 2000. The NVSS database includes information from all death certificates filed in the United States. Cause of injury is classified using underlying causes of death as indicated by attending physicians, medical examiners, and coroners. Crude death rates, restricted to children ages 14 and under, were calculated using population data from the Bureau of the Census.

As 1988 was the first full year of funding for the Campaign, data for 1987 were used as the baseline year from which to establish trends. Unintentional injury death rates, defined as the number of deaths per 100,000 population, account for the 13 percent increase in the number of U.S. children ages 14 and under (1987 to 2000). Death trends were presented for the principal causes of childhood unintentional injury-related death: motor vehicle occupant injury, pedestrian injury, bicycle-related injury, drowning, fire and burn injury, airway obstruction injury (including suffocation and choking), firearm injury, falls and poisoning. In addition, death rates were analyzed by U.S. geographic region (Northeast, South, Midwest and West), age group (under 1 year, ages 1 to 4, ages 5 to 9 and ages 10 to 14), race (white, black, Asian/Pacific Islander, American Indian/Alaskan native, other), sex and ethnicity (Hispanic and Non-Hispanic). Ethnicity data were available for all U.S. states from 1997 through 2000 only.

The overall unintentional injury death rate trends (for children ages 14 and under, as well as by child age group) and injury mechanism-specific mortality trends for death rates among children ages 14 and under were tested for statistical significance using the chi-square test for trend (EpiInfo 2002 Version 6, Centers for Disease Control and Prevention, Atlanta GA) and found to be significant (defined as $p<0.05$).

TECHNICAL NOTE

Injury and poisoning deaths are classified according to external cause of injury codes of the World Health Organization's International Classification of Diseases. The tenth revision of the ICD (ICD-10), adopted in the U.S. in 1999, instituted substantial changes to external cause codes of the ninth ICD revision (ICD-9), which may affect the ability to compare years before and after 1999. Preliminary comparability ratios, which measure discontinuity between ICD revisions, were provided by NCHS and are provided in the following table, along with the ICD-9 and ICD-10 codes for each injury mechanism examined by this study. In order to account for injury coding changes that occurred between 1998 and 1999, trends were adjusted by applying comparability ratios to death rates for years prior to 1999. This discontinuity between ICD revisions is depicted in the graphs of this report by a line break separating data years 1998 and 1999.

Category codes for selected mechanisms of unintentional injury according to the Ninth and Tenth Revisions, International Classification of Diseases, and associated comparability ratios.

Mechanism of Injury	ICD-9[1] Category Codes	ICD-10[1] Category Codes	Comparability Ratio[2]
All unintentional injury	E800-869, E880-929	V01-X59, Y85-86	1.0303
Motor vehicle occupant	E810-819 (.0,.1)	V30-39 (.4-.9)	0.9754
Drowning	E830.0-.9, E832.0-.9, E910.0-.9	W65-74	0.901274
Pedestrian	E810-819(.7), E800-807(.2), E820-825(.7), E826-829(.0)	V02-04(.1,.9), V09.2, V01, V02-04(.0), V05, V06, V09 (.0,.1,.3,.9)	0.996185
Pedestrian (motor vehicle-related only)	E810-819(.7)	V02-04(.1,.9), V09.2	0.881127
Pedal cycle	E810-819(.6), E800-807(.3), E820-825(.6), E826.1,.9, E827-829(.1)	V12-14(.3-.9),V19(.4-.6), V10-11, V12-14 (.0-.2), V15-18, V19(.0-.3,.8,.9)	0.977778
Pedal cycle (motor vehicle-related only)	E810-819(.6)	V12-14(.3-.9),V19(.4-.6)	0.932515
Suffocation	E911-913.9	W75-84	1.330682
Fire/burn	E890.0-899, E924.0-.9	X00-19	0.97963
Firearm	E922.0-.3,.8,.9	W32-34	1.11036
Fall	E880.0-886.9, E888	W00-19	0.978068
Poisoning	E850.0-869.9	X40-49	0.886161

[1] ICD-9 is International Classification of Diseases, Ninth Revision, and ICD-10, the International Classification of Diseases, Tenth Revision.

[2] Source: National Center for Health Statistics, March 2003, Centers for Disease Control and Prevention.

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